CLAIMS:

1. A surface plasmon resonance sensor chip comprising:

a transparent substrate; and

a metal layer including concave parts or convex parts on a surface and a flat part positioned between the concave parts or the convex parts, and formed so as to cover the surface of the substrate.

2. The surface plasmon resonance sensor chip according to claim 1, wherein the substrate is a substrate with a flat surface, and the convex parts are a plurality of metal particles immobilized spaced apart from each other on a metal thin film, which is the flat part.

3. The surface plasmon resonance sensor chip according to claim 1, wherein the substrate is a substrate with a flat surface, and the concave parts or the convex parts are a plurality of microscopic concave parts and convex parts formed spaced apart from each other on a metal thin film, which is the metal layer, the concave part not passing through the metal thin film.

4. The surface plasmon resonance sensor chip according to claim 1, wherein a plurality of microscopic convex parts or microscopic concave parts are formed spaced apart from each other on one surface of the substrate, and the metal layer is formed on the one surface of the substrate so as to reflect the shape of the microscopic convex parts or the microscopic concave parts.

5. The surface plasmon resonance sensor chip according to claim 1, wherein the material of the metal layer is gold or silver.

6. A method of manufacturing a surface plasmon resonance sensor chip, the method comprising the steps of:

forming a metal thin film on one surface of a substrate through sputtering

or deposition;

chemically modifying the surface of the metal thin film; and

immersing the chemically modified substrate into a liquid solution of metal particles.

7. A method of manufacturing a surface plasmon resonance sensor chip, the method comprising the steps of:

immersing one surface of a substrate in a liquid solution of aminosilane coupling agent;

immersing the substrate into a liquid solution of metal particles;

cleaning the substrate; and

forming a metal thin film on the one surface through sputtering or deposition.

8. A surface plasmon resonance sensor comprising:

a surface plasmon resonance sensor chip according to any one of claims 1 to 5;

a prism arranged on the side of the chip not formed with the metal layer;

a light source for irradiating light on the chip through the prism; and

a light detector for measuring the reflectivity of the light by the metal layer.

9. A method of measurement of biomolecules of irradiating the light from the optical system to the surface plasmon resonance sensor chip according to claims 1 to 5, totally reflecting the light at the interface of the metal layer and the substrate of the chip, and measuring the intensity of the reflected light with the light detector; wherein

the presence or the extent of interaction of biomolecules is measured from the change in intensity of the reflected light with respect to the change in

frequency of the irradiated light.

10. A method of detecting change in index of refraction of irradiating the light from the optical system to the surface plasmon resonance sensor chip according to claims 1 to 5, totally reflecting the light at the interface of the metal layer and the substrate of the chip, and measuring the intensity of the reflected light with the light detector; wherein

change in index of refraction based on interaction of molecules at the metal layer surface, and change in index of refraction based on interaction with solvent in the vicinity of the metal layer are respectively detected by measuring the change in the resonance angle of the reflected light.